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AUTHOR Niang, Mamadou
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ABSTRACT

This paper argues that further distinctions of syllable weight are necessary to account for certain phonological processes. It is shown that Pulaar, a dialect of Fula, makes a four-way weight distinction. In addition, the analysis shows that previous analyses of Pulaar metrical structure are inadequate. The paper provides a comprehensive analysis of Pulaar metrical structure in single nominal and verbal complexes and others with derivational suffixes. The proposed analysis accounts neatly for all types of stress alignment patterns that obtain in Pulaar without recourse to additional rules. (Author/JL)

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SYLLABLE "SONORITY" HIERARCHY AND PULAAR STRESS: A METRICAL APPROACH

MAMADOU NIANG
UNIVERSITY OF MISSOURI - KANSAS CITY

Abstract: "Syllable weight is usually viewed as a binary opposition ..." (Hayes 1989). That is, syllable weight distinctions are claimed to be at most binary: heavy vs light; bimoraic vs monomoraic. This paper argues that further distinctions of syllable weight are necessary to account for certain phonological processes. I argue and show that Pulaar (a dialect of Fula), makes a four way weight distinction. In addition, the analysis adopted in this paper shows that previous analyses of Pulaar metrical structure are inadequate.

I) Previous Analyses

Previous attempts to analyze Fula metrical structure have led to interesting remarks and generalizations. Taylor (1953) remarks that stress, depends on the long vowels. Arnott (1970) indicates that the first syllable is the salient syllable. According to McIntosh (1984) stress occurs on the last non final CVC or CVV syllable or on the initial syllable of the word in the absencé of a heavy syllable. Prunet and Tellier (1984) indicate that the main stress falls on the first heavy syllable (CVV, CVC) starting from the left (beginning of the word). In the absence of a heavy syllable in a word, the major stress falls on the first syllable of the word.

II) Pulaar Metrical Structure

Before proposing an analysis, it is in order to provide the stress patterns that obtain in the language and examples to illustrate these patterns. The letter D stands for a dental implosive, B a bilabial implosive, Y a palatal implosive and ? a glottal stop.

Stress Patterns

The data in (1) through (6) illustrates the various stress patterns that obtain in Pulaar.

1)

a'ba bo	"type of grass"
wu'de ɾe	"sarong"
a'l ku lal	"character of the alphabet"
a'sa maan	"sky"

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From this data two observations can be made. First, the last syllable is never stressed. Second, the major stress falls on the first syllable of the word. In order to determine the adequacy of the above generalizations, additional data is provided in (2).

2)

ji yaa'Do	"slave"
fo doo're	"destiny"
ja maa'nu	"world"
bo na'n de	"harm"

The data in (2) indicates that the second observation is inadequate since the stress does not fall on the first syllable of the word. Instead, it falls on the penult. This second observation needs to be revised somewhat to account for all the data presented so far. The major stress is placed on the heavy non final syllable. If there is no heavy non final syllable, the major stress is placed on the first syllable of the word. This accounts for the data presented so far. To determine the adequacy of this revised observation additional data is considered in (3).

3)

ta'k kor di	"wet flour"
maa'maa re	"tree"
yaa'kaa re	"hope"

As formulated, the revised observation does not account for the data in (3). In (3) there are two heavy non final syllables and the revised observation does not indicate which one will bear the major stress. Additional revision is in order to accommodate the set of data in (3). The major stress falls on the heavy non final syllable of the word if it is the only heavy non final syllable in the word. In the presence of two non final heavy syllables, the stress falls on the first syllable of the word. In the absence of a heavy non final syllable, stress the first syllable of the word. These revisions will account for the data presented so far.

In order to determine the adequacy of these revisions, additional data is considered in (4).

4)

hal kaa'de	"to perish"
fer laa'de	"to squat"
haf taa'de	"to rise up"

These revisions cannot account for the placement of the major stress in (4). As a matter of fact, we have two heavy non final syllables in the words in (4) but the major stress is not placed on the first syllable of the words as predicted by the latest revised proposal. This proposal will then require further revisions in terms of the structure of the non final heavy syllables. If the non final heavy syllables are of the CVC and CVV patterns, then the major stress falls on the syllable with a CVV structure. This revised proposal will account for the cases in (4). In order to determine the suitability of this newly revised proposal, another set of data is considered in (5).

5)

jaa taa'r naa jo	"person from Jaataar"
ⁿjaa yee'm naa jo	"person from ⁿjaayeem"
naa naa'l de	

This revision does not account for the data in (5). To account for these problematic data, further revision is necessary. This revision is done using the structure of the syllables as this seems to be the determining factor for the assignment of the major stress. When non final heavy syllables have the structure CVV and CVVC, the major stress falls on the non final CVVC syllable. The adequacy of this new revision is tested against further data as in (6).

6)

haa'l pu l'aar ?en	"speakers of Pulaar"
waa'l waal du	"type of bird"

This newly revised proposal does not indicate where to place the major stress in this particular case. There are two non final heavy syllables of the structure CVVC and the proposal does not indicate where the major stress is to be placed. To account for these data, we need to indicate that in the presence of heavy non final syllables of the structure CVVC, the major stress falls on the leftmost heavy syllable of the word.

The observations that have been made so far seem to indicate that the placement of the major stress is determined by the weight of the heavy syllable.

Having made the above observations, we will now make generalizations about the placement of the major stress in Pulaar.

Generalizations

The last syllable of the word is never stressed. Stress the first syllable if there is no heavy syllable in the word as in (7).

7)

a'du na	"world"
ba'la be	"shoulders"

Stress the penult syllable if it is the only heavy syllable in the word as in (8).

8)

ma laa'Do	"blessed person"
da do'r de	"waist / belt"

When both first and penult syllables have the same structure CVC, CVV or CVVC, stress the first syllable as in (9).

9)

ta'l lor de	"place for rolling over"
CV'C CVC CV	
baa' waa do	"weak / defeated person"
CVV CVV CV	
haa'l pu l'aar ?en	"speakers of Pulaar"
CVVC CV CVVC CVC	

When both first and penult syllables are heavy but with different weight, stress the heaviest syllable. CVVC is heavier than CVV which in turn is heavier than CVC which is heavier than CV as in (10).

10)

hal kaa' de	"to perish"
CVC CVV CV	
gaa's to t'oo Do	"person who digs"
CVVC CV CVV CV	
ha'l ku de	"to make perish"
CVC CV CV	

Secondary Stress in Nominal and Verbal Complexes

In their analysis of Pulaar metrical structure Prunet and Tellier (1984) make the following assertion while referring to secondary stress.

> 'Les autres syllabes lourdes du mot portent des accents secondaires.' p. 81
> 'The other heavy syllables of the word carry secondary stresses.' (my translation)

Even though they acknowledge the presence of secondary stress in words, their rendering of the placement of the secondary stress is not accurate. Their claim for the placement of secondary stresses on every heavy syllable can lead to stress clash.

Considering the data in (11)

11)

j'aa taa'r n'aa jo	"person from Jaataar"
k'aa sa maa's n'aa jo	"person from Casamance"

In (11) above, the syllable carrying the major stress is immediately preceded and followed by heavy syllables to which their analysis will assign secondary stresses thus leading to stress clash. Also, stress systems tend to show some alternation between stressed and unstressed syllables. In Prunet and Tellier's analysis this alternation between stressed and unstressed will not obtain in the instance illustrated above.

Secondary stress occurs only in tetrasyllabic and pentasyllabic complexes. In disyllabic complexes, the last syllable is extrametrical and the major stress falls on the first syllable of the word. Therefore secondary stress cannot occur in disyllabic complexes. In trisyllabic words, the last syllable is also always extrametrical. The major stress can occur either on the first or second syllable of the word. This might leave the syllable that does not carry the major stress open for secondary stress asssignment. The unstressed syllable will not carry secondary stress because there must be an intervening syllable between the syllable carrying the major stress and the one carrying the secondary stress. This type of situation never arises in trisyllabic complexes. For these reasons trisyllabic complexes do not carry secondary stress. Only heavy syllables can carry a secondary stress. A heavy syllable that is adjacent to the syllable carrying the major stress does not carry secondary stress. A secondary stress can occur in any position except in syllable final position.

The following data illustrates the presence of secondary stress in tetrasyllabic and pentasyllabic complexes.

Tetrasyllabic Complexes

Tetrasyllabic complexes exhibit various patterns as illustrated in (12).

12)

j'ol ti noo' wo	"person who removes out of"
baa' bal n'aa jo	"person from Baabal"
haa'l pu l'aar ?en	"speakers of Pulaar"
gaa's to t'oo Do	"person who digs"
laa'l to t'oo Do	"person who lays mud"
ñaa' go too Do	"person who requests"
ñaa'l tin too Do	"person who takes leftovers"

Pentasyllabic Complexes

Like tetrasyllabic complexes, pentasyllabic complexes exhibit various patterns as illustrated in (13).

13)

baa' bi r'aa ge lam	"my little dat"
k'aa sa maa's naa jo	"person from Casamance"
gaa's to to n'oo Do	"person who was digging up"
ñaa'l tin to noo Do	"person who was sleeping"

Having discussed the facts concerning the assignment of stress, I will now consider the type of analysis that Halle and Vergnaud's approach may provide for the analysis of Pulaar metrical structure.

Analysis

The following may be the kind of analysis that will be given within the Halle and Vergnaud's framework to account for the metrical structure of Pulaar.

Vowels that are heads are stress bearing elements
The last syllable is extrametrical
-Assign an asterisk to every syllable
-Assign another asterisk to a syllable with a long vowel
-Assign another asterisk to a closed syllable.
Line 0 Parameter settings are [+HT, -BND, right to left and left]. Construct constituents on line 0 and project the head(s) on line 1.
Line 1 parameter settings are [+HT, -BND, right to left and left]. Construct constituents on line 1 and project the heads on line 2.
To determine the adequacy of this analysis, it is tested against some data.

Considering the data in (14)

14)

ba'la be "shoulders"

```
(*  *)<*> 0
 *        1
```

This type of data is accounted for by the proposed analysis. The adequacy of this proposed analysis is tested against further data.

Considering the data in (15)

15)

```
  ta'l lor de          baa' waa Do
   *     *  <*>         *     *   *  0
  (*     *)             (*     *)     1
   *                     *             2
```

The last syllables are extrametrical. By virtue of being closed or long syllables, these are assigned a line 1 grid mark. Constructing constituents on line 1 and projecting the heads will provide the correct output. However, secondary stresses occur where they do not occur.

Considering the data in (16)

16)

```
 ji yaa' Do          "slave"
  *   *   <*> 0
      *       1
```

If we construct an unbounded left headed constituent on line 0 and project the head we get the construction in (17).

17)

```
  ji  yaa' Do
  (*   *)  <*> 0
   *   *       1
```

Two asterisks appear on line 0 one of which is the head of the constituent constructed from line 0 and the other asterisk which was already present on line 1. If we construct a left headed constituent on line 1 and project the head on line 2, the derived output is (18).

18)

```
 ji yaa do
 (*  *) <*>  0
 (*  *)      1
  *           2
```

This, however is not the correct output. As a matter of fact, the major stress ends on the first syllable instead of the second syllable. To derive the correct output, a stress shift rule is needed to shift the stress to its correct position. Following Davis (1988) this stress shift rule is formulated in the following.

Stress Shift Rule

Shift a line 2 grid mark from the first to the second syllable if the second syllable is heavy and the first is light.

The application of this stress shift rule will lead to the output in (19).

19)

```
  ji yaa do
  (*  *) <*>  0
  (*  *)      1
      *        2
```

A secondary stress appears incorrectly on the first syllable.

Considering the data in (20)

20)

```
     jaa  taa'r naa jo        "person from Jaataar"
      *    *     *  <*>  0
      *    *     *       1
           *             2
```

If we construct one constituent on line 1 and project the head on line 2 we get the output in (21).

21)

```
  jaa taa'r naa jo
   *   *     *  <*>  0
  (*   *     *)      1
   *   *             2
```

If we construct a constituent on line 2, project the head on line 3 and conflate lines 1 and 2 we get the structure (22).

22)

```
      jaa   taa'r naa jo
       *     *     *  <*>
      (*     *)
       *
```

In order to account for this type of data we need to revise our stress shift rule to read (23).

23)

Shift a line 2 grid mark from the first to the second syllable if the second syllable is heavier than the first.

After the application of this stress shift rule, we get the structure (24).

24)

```
  jaa taa'r naa jo
   *    *    *  <*> 0
   *    *          1
        *          2
```

The proposed analysis appears to account for the data presented so far. However, incorrectly placed secondary stresses occur.

Considering the data in (25)

25)

```
  jol ti noo' wo     "person who removes out of"
   *   *  *   <*>  0
  (*      *)       1
   *               2
```

The analysis will lead to the incorrect placement of the major stress on the first syllable. Applying the stress shift rule will then shift the stress to its normal position.

The analysis appears to provide a correct account of some aspects of Pulaar metrical structure. However, on a number of instances we had to invoke additional rules in order to derive the correct output. Also, in many instances, incorrectly placed secondary stresses occur.

In what follows is proposed a simpler analysis of Pulaar metrical structure based on the weight hierarchy among the syllables in the language. The proposed analysis does not need to invoke stress shifting rules and the addition of destressing rules solves the problem of incorrectly placed secondary stresses.

Proposed Analysis

The analysis proposed here to capture word stress assignment in Pulaar is as follows.

a) Stress bearing elements are vowels

b) Vowels that are head of rhymes are stress bearing.

c) The last syllable of the word is marked extrametrical.

d) Line 0 parameter settings are [+HT, +BND, right to left].

On line 0, construct binary left headed constituents if the left syllable in the constituent is equal to

or more sonorous than the right syllable; otherwise, construct right headed constiutents.
Project the head(s) on line 1.
e) Line 1 parameters are [+HT, +BND, right to left]. On line 1, construct binary left headed constituents if the left syllable in the constituent is equal to or more sonorous than the right syllable; otherwise construct right-headed constituents.
Project the head(s) on line 2.
f) Line 2 parameter settings are [+HT, +BND, right to left].
If necessary, on line 2, construct binary left headed constituents if the left syllable in the constituent is equal to or more sonorous than the right syllable in the constituent; otherwise construct right-headed constituents. Project the head on line 3.
g) Apply the appropriate stress deletion rule (s) 1 and/or 2 to eliminate the incorrect placement of the secondary stress.

In order to prevent the incorrect placement of secondary stress, following Davis (1988) two destressing (stress deletion) rules are proposed.

The operation of these destressing rules will be shown in due course.

In what follows, the proposed analysis is applied to cases that were problematic with the Halle and Vergnaud's analysis. This proposed analysis provides a neat account of Pulaar metrical structure without recourse to additional rules.

Considering the data in (26)
26)

CVV	CVV'C	CVC	
jaa	suu's	?en	"spies"
haa	buu's	?en	"useless / fair person"
(*	*)	<*>	0
	*		1

On line 0 we construct a binary right headed constituent since the left syllable in the constituent is less sonorous than the right syllable in the constituent. We then project the head on line 1.

Considering the data in (27)

27)

```
naa naa'l de
maa maa'y de
yaa naa'l de
guu huu'n De
tee tii's De
(*   *)   <*> 0
     *        1
```

In both (26) and (27), the major stress falls on the CVVC syllable which is the heaviest. This situation obtains only because the CVVC syllable is heavier than the CVV syllable.

Tetrasyllabic Nominals

The stress pattern of four syllable words is fairly consistent. In general, the major stress falls on the first or penult syllables of the word.

Considering the data in (28)

28)

```
j'oy yi noo' wo    "person who places down"
b'al li noo' wo    "person who spends the night"
 (*) (*  *)  <*> 0
 (*      *)      1
         *       2
```

Applying line 0 and line 1 parameter settings to the data in (28) yields the correct results. To determine the adequacy of this analysis, we will test it against further data.

Considering the data in (29)

29)

```
jaa' fo t'oo Do        "person who forgives"
baa' bi r'aa Do        "father"
(*) (*    *) <*> 0
(*        *)     1
 *               2
```

Here again, the application of line 0, line 1 and line 2 parameters leads to the corret output. Both major and secondary stresses are correctly placed. To account for the appropriateness of this analysis, we test it against further data.

Considering the data in (30), (31) and (32)

30)

```
ⁿjaa yee'm naa jo    "person from Njaayeem"
ⁿjaa ree'm naa jo    "person from Njareem"
 (*) (*     *) <*> 0
 (*   *)          1
       *          2
```

31)

```
k'aa sa maa's naa jo    "person from Casamance"
(*   *) (*     *) <*> 0
(*       *)          1
         *           2
```

32)

```
su wee raa't naa jo     "person from Zouerate"
nu waa soo'r naa jo     "person from Nouakchott"
(*  *) (*     *) <*> 0
   (*   *)          1
        *           2
```

All the data in (30) through (32) is accounted for by the application of line 1 and line 2 parameters.

Nominals with Derivational Suffixes

The behavior of derivational affixes with respect to stress assignment is very revealing. Some derivational suffixes influence the placement of the major stress while others do not. The derivational suffixes considered here are: "-am, -ji, -el/al". -am is a first person singular possessive suffix; -ji is a plural suffix; -el/al are diminutive and augmentative suffixes respectively.

The first part of this section deals with the use of derivational affixes which do not affect the placement of the major stress. The derivational suffix in question is '-am' which represents the first person singular possessive marker.

Considering the following data (33)

33)

co'k tir ga lam "my key"
Bo'f tir ga lam "my pick up instrument"

```
(*)  (*   *)<*> 0
(*    *)       1
 *             2
```

In (33), the major stress falls on the first syllable as expected. On line 0 we mark the last syllable extrametrical and construct a binary left headed foot and a degenerate foot. On line 1 we construct a left headed constituent since the two syllables are of equal sonority and then project the head on line 2. Our stress deletion rule will eliminate the secondary stress on line 1 and we derive the correct output as illustrated in (34).

34)

```
Bo'f tir ga lam
(*)  (*   *)<*>  0
 *              1
 *              2
```

Another suffix which affects stress assignment is the plural suffix -ji. The addition of this plural suffix to certains singular nouns can create conditions leading to the forward shifting of the major stress as in (35) and (36).

35)

Ba taa'ke "letter"
ka baa'ru "piece of news"

The data in (35) shows that the major stress falls on the penult which is the only heavy syllable in the word. This stress assignment is consistent with the stress assignment principles formulated earlier.

The addition of the plural suffix to the plural forms in (35) changes their structure in two ways. First of all, the vowel of the singular penult is no longer heavy. The vowel of the last syllable of the singular form is lengthened and the primary stress of the word is assigned to it as in (36).

36)

Ba ta kee'ji "letters"

```
(*)(*  *) <*> 0
(*     *)     1
       *      2
```

Applying our analysis we mark the last syllable extrametrical and build constituents on line (0). On line 1 we build a right headed constituent and project the head on line 2 since the syllable in the right is more sonorous than the one in the left. The stress deletion rule 2 will delete the secondary stress on line 1 and the correct output is derived in (37).

37)

```
Ba ta kee' ji
(*)(*  *)  <*>  0
       *       1
       *       2
```

Other types of suffixes that affect stress assignment are the diminutive and augmentative suffixes. In both their singular and plural forms, the addition of the diminutive or the augmentative suffix affects the stress placement in words. The singular forms of the dimunitive and augmentative suffixes are -el and -al respectively. Unlike the plural suffix -ji which causes the forward shifting of the major stress, the dimunitive and augmentative suffixes can lead to the retraction of the major stress. These patterns are illustrated in (38) and (39).

38) 39)

```
Ba taa'ke + el/al --→ Ba'ta kel/Ba'ta kal
ka baa'ru + el/al --→ ka'ba rel/ka'ba ral
```

The comparison of the forms in (38) and (39) shows stress retraction to the first syllable. As predicted by the analysis, since the last syllable of the word is extrametrical, the major stress falls on the first syllable of the word when there is no heavy syllable in the word other than the last syllable. The addition of the diminutive/augmentative suffixes leads to the restructuring of the previous constituents as illustrated in (40).

40)

```
Ba'ta kel          "little letter"
(*  *)<*>  0
 *         1
```

The long vowel has been shortened and the major stress falls by default on the first syllable of the word.

Conclusion

This paper has provided a comprehensive analysis of Pulaar metrical structure in single nominal and verbal complexes and others with derivational suffixes. The proposed analysis accounts neatly for all types of stress assignment patterns that obtain in Pulaar without recourse to additional rules. In the process of analyzing Pulaar metrical structure, inadequacies of previous analyses were indicated and data was provided that shows that Pulaar makes a four-way-weight distinction among the syllables.

REFERENCES

Angoujard, Jean Pierre (1990). Metrical Structure of Arabic. Foris Publications. Dordrecht. Holland.

Arnott, D.W. (1970). The Nominal and Verbal Systems of Fula. Oxford: Clarendon Press.

Davis, S. (1985a). Syllable Weight in some Australian Languages. BLS II. 398-407.

-----, S. (1988). "Syllable Onsets as a Factor in Stress Rules," Phonology Yearbook v. 5 no 1, 1-19.

Everett, D., and K. Everett (1984). "On the Relevance of Syllable Onsets to Stress Placement," Linguistic Inquiry 15, 705-711.

Franks, S. (1985). "Extrametricality and Stress in Polish," Linguistic Inquiry 16, 144-151.

Gregerich (1986). "Relating to Metrical Structure" in Jacques Durand, ed., Dependency and Non Linear Phonology, 223-256.

Halle, M. and J.R. Vergnaud (1987b). An Essay on Stress. Cambridge, Massachusetts: MIT Press.

Harris, James W. (1989). "The Stress Erasure Convention and Cliticization in Spanish," Linguistic Inquiry 20, no. 3, 339-363.

Hayes, B. (1982). "Extrametricality and English Stress," Linguistic Inquiry 13, 227-276.

----➤ B. (1983). "A Grid-based Theory of English Meter," Linguistic Inquiry 14, 357-93.

------ B. (1989). "Compensatory Lengthening in Moraic Phonology," Linguistic Inquiry 20, 253-306.

Hyman, L. M. (1985). A Theory of Phonological Weight. Foris Publications, Dordrecht.

McIntosh, Mary (1984). Fulfulde Syntax and Verbal Morphology. St Edmundsbury Press Ltd.

Paradis, C & Jean Francois Prunet (1989). "On Coronal Transparency," Phonology 6, 317-348.

Prunet, J. F. & C. Tellier (1984). "Interaction des Niveaux en Phonologie: l'Abregement Vocalic en Pulaar," McGill Working Papers in Linguistics 2, 65-90.

Taylor, F. W. (1921). A First grammar of the Adamawa Dialect of the Fulani Language (Fulfulde). Oxford University Press.